

Generalized Heegner cycles and p -adic L -functions in a quaternionic setting

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Abstract. In a recent paper, Castella and Hsieh proved results for Selmer groups associated with Galois representations attached to newforms twisted by Hecke characters of an imaginary quadratic field. These results are obtained under the so-called Heegner hypothesis that the imaginary quadratic field satisfies with respect to the level of the modular form. In particular, Castella and Hsieh prove the rank 0 case of the Bloch-Kato conjecture for L -functions of modular forms in their setting. The key point of the work of Castella and Hsieh is a remarkable link between generalized Heegner cycles and p -adic L -functions. In this paper, several of the results of Castella-Hsieh are extended to a quaternionic setting, that is, the setting that arises when one works under a “relaxed” Heegner hypothesis. More explicitly, we prove vanishing and one-dimensionality results for Selmer groups. Crucial ingredients in our strategy are Brooks results on generalized Heegner cycles over Shimura curves.

Mathematics Subject Classification (2020): 11F11 (primary); 14G35 (secondary).